Long Island Rail Road

Implementation of Communications Based Train Control (CBTC)

Presentation to RSAC Positive Train Control Group
Federal Railroad Administration

November 9, 2000

Long Island Rail Road
Implementation of CBTC
Agenda

- **Background**
- **Why CBTC?**
  - **LIRR needs**
  - **CBTC benefits**
- **Babylon to Montauk Project**
  - **Scope**
  - **Schedule & Progress**
  - **Budget**
  - **Next Steps**

Background:
Mission Statement

- **Provide a complete stand-alone communication-based train control (CBTC) system between Babylon and Montauk that increases service capacity and improves operational safety.**

- **Establish a standard for all future systems such that CBTC may be implemented system-wide to meet all service capacity, operational safety and on-time performance requirements in a cost-effective manner.**

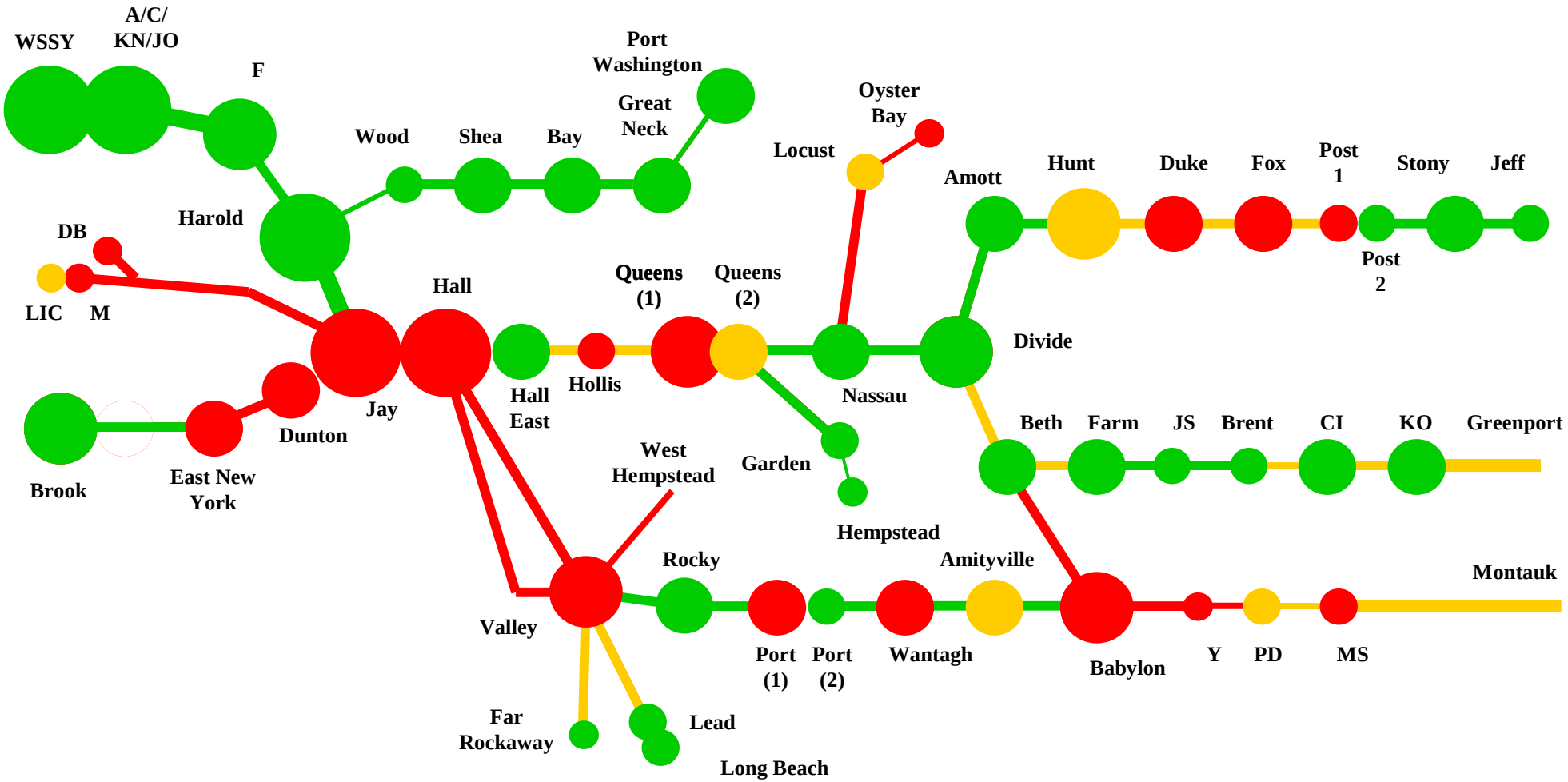
Background:
LIRR Signal Strategy

- **Developed and adopted in 1997.**
  - **Long-term cohesive plan.**
- **Addresses safety and reliability in early phases.**
  - **Basis for current (2000-2004) capital program.**
  - **$ 138 Million committed to signal projects.**
- **Addresses capacity expansion in later phases.**
  - **Plan for three subsequent capital programs determined.**
  - **Additional $ 450 Million planned.**
- **CBTC plays a major role.**

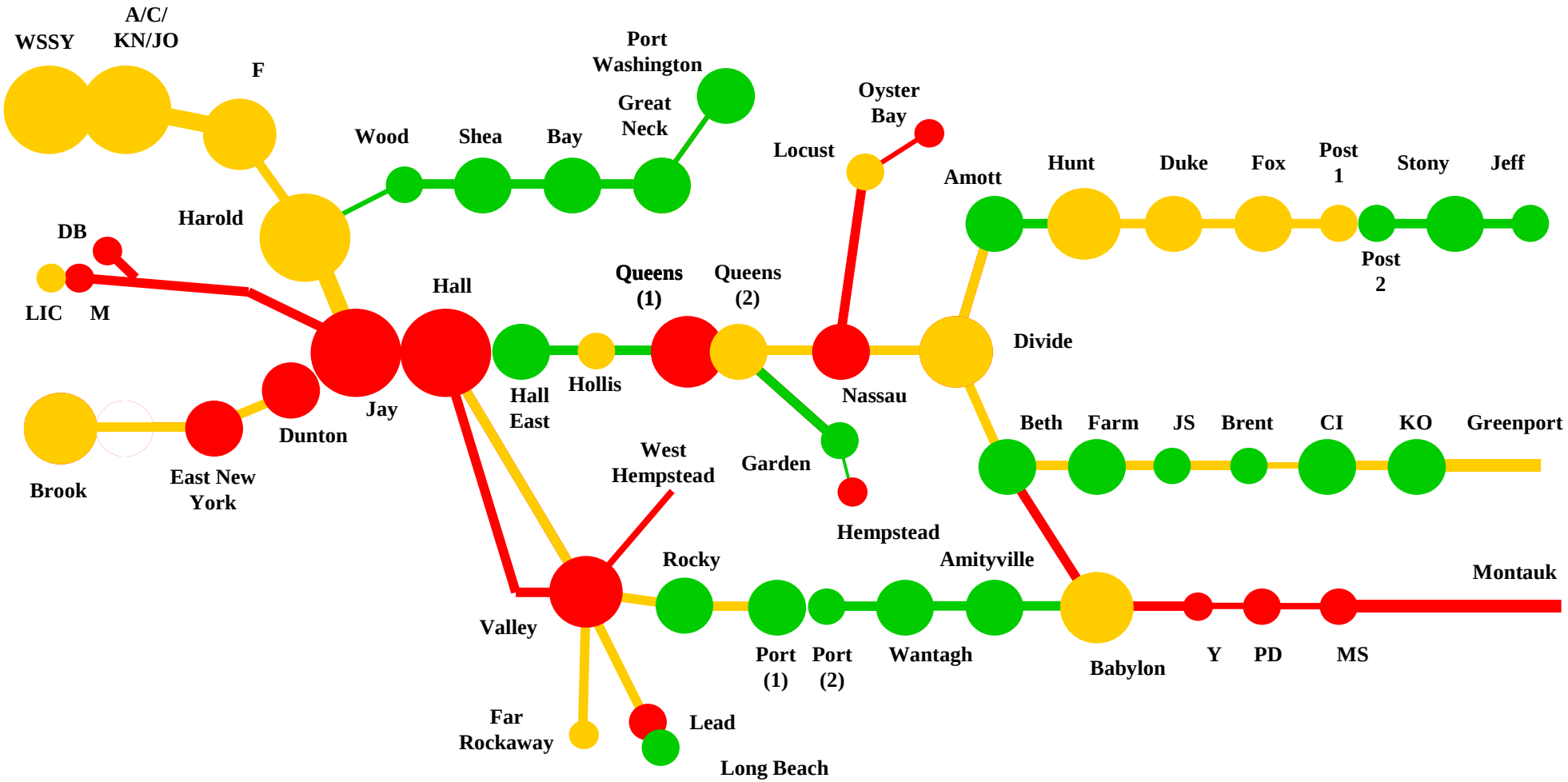
Why CBTC?
LIRR Needs

- **Improve operational safety.**
  - **“Dark” territory**
- **Expand system capacity.**
  - **Manual block**
- **Improve on-time performance.**
- **Reduce future costs.**

Signal System Condition: 11/2000



Signal System Suitability: 11/2000 (Capability to support service)



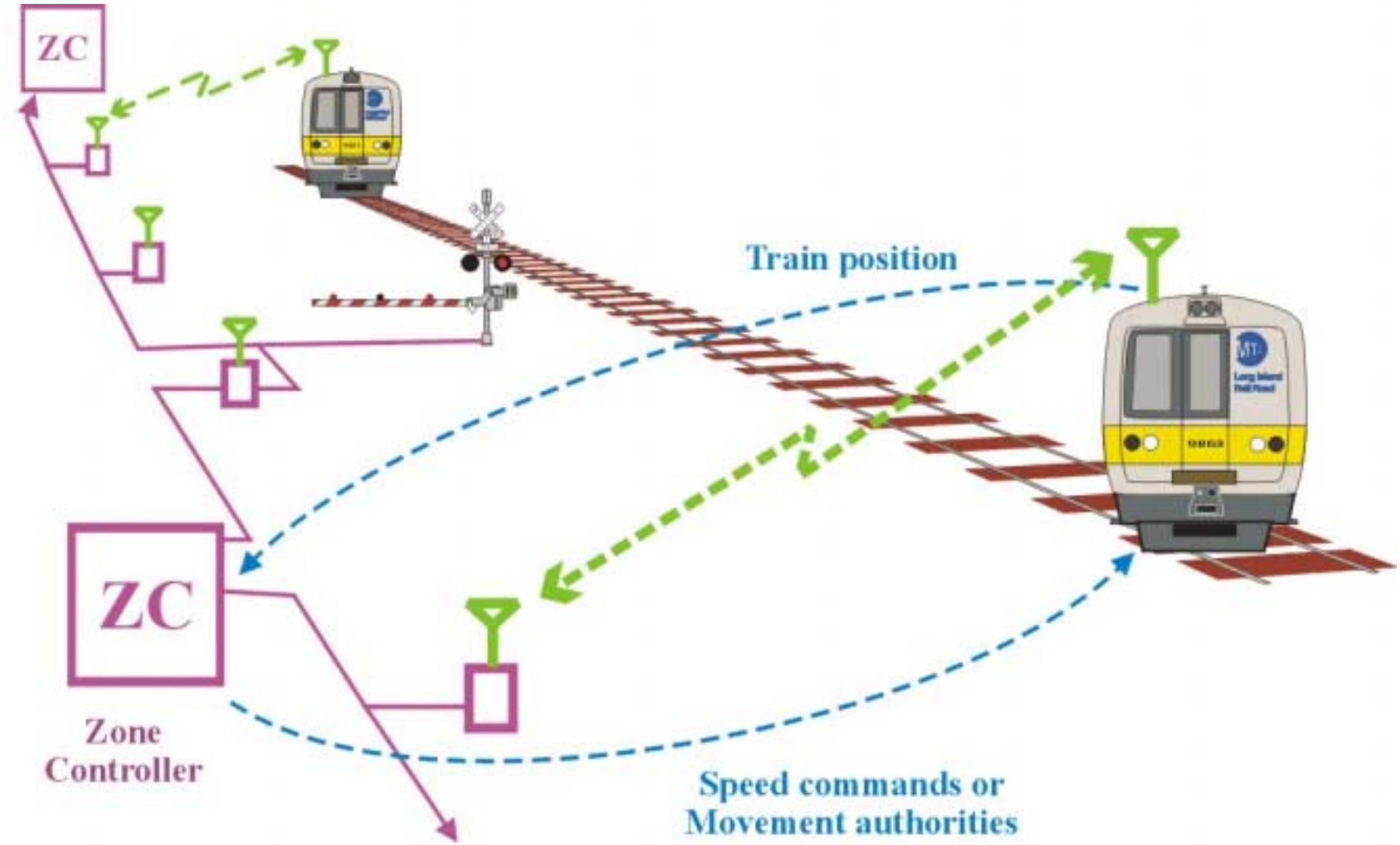
Why CBTC?
Benefits

- **Improved operational safety**
  - **Positive stop**
  - **Continuous speed enforcement**
    - **Including civil / temporary restrictions and roadworker protection.**
  - **Consistent grade crossing warning time**
- **Increased capacity**
  - **Optimized train separation**
  - **Optimized speed enforcement**

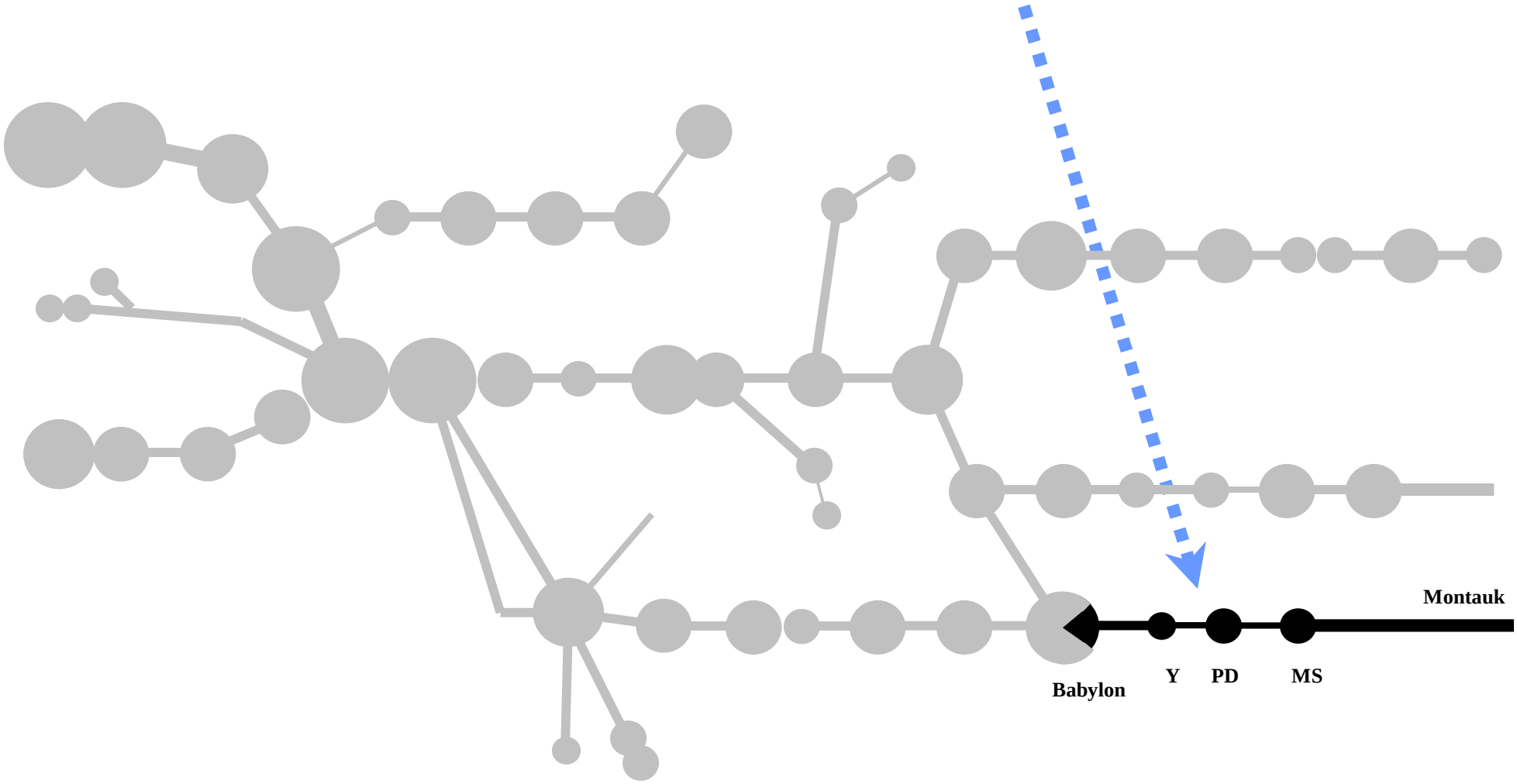
Why CBTC?
Benefits

- **Improved reliability / Reduced future costs**
  - **Elimination of track circuits for train detection**
  - **Simplified design / reduction in equipment**
  - **Use of "commercial off-the-shelf" (COTS) equipment**

CBTC Block Diagram



Babylon to Montauk Project



Existing Physical Characteristics

- 78 miles
  - 13 miles double track with single direction automatic block signaling (ABS), no cab signals
  - 65 miles single track with manual block (dark)
- Four interlockings
- 98 grade crossings with active warning devices
- 16 Stations
- Class 4 track (80 MPH)

Existing Rolling Stock

- 23 DE-30 diesel locomotives
- 23 DM-30 dual-mode locomotives
- 23 C-3 cab cars
- 101 C-3 coaches
- 20 conventional locomotives
  - LIRR work trains
  - New York & Atlantic

Existing Service Levels

- **Trains**

Territory	Daily Trains (approx.)		
	Total	Pass'gr	Other
Babylon to Patchogue (PD)	64	58	6
Patchogue (PD) to Speonk (SK)	38	34	4
Speonk (SK) to Montauk (MY)	24	22	2

Why Babylon to Montauk?

- **Primarily "dark" territory / manual block operation**
  - **Opportunity for significant safety improvement.**
  - **Opportunity for improvement in operational capacity and flexibility.**
  - **No broken rail protection east of Patchogue.**
- **Maximum authorized speed is 65 MPH.**
  - **Due to fixed crossing approaches.**
- **Existing systems are obsolete.**

Babylon to Montauk CBTC
Goals

- **Provide a complete stand-alone CBTC system that addresses LIRR needs.**
  - **Enhance suitability to support and improve service.**
- **Establish a CBTC standard for future system-wide implementation.**
- **Secure FRA approval.**

Babylon to Montauk CBTC
Scope

- **Provide CBTC train separation.**
  - **Positive stop**
  - **Speed restriction enforcement**
- **Eliminate track circuits for train detection.**
- **Interlockings**
  - **Rehabilitate three.**
  - **Expand and rehabilitate one.**
  - **Add seven.**

Babylon to Montauk CBTC
Scope

- **Grade crossings**
  - **Rehabilitate 98.**
  - **Add active warning devices to two.**
  - **Provide constant warning times at all 100.**
- **Provide for the movement of unequipped or "CBTC-failed" trains.**
- **Provide remote control capability.**
  - **Temporarily from Babylon Tower.**
  - **Long-term from new Jamaica Central Control.**

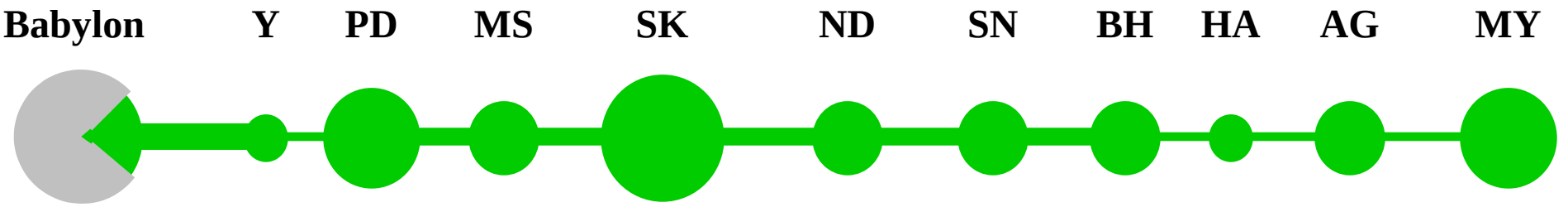
Babylon to Montauk CBTC
Scope

- **Evaluate broken rail solution in long term.**
  - **Not an inherent part of current CBTC technology.**
  - **Allow for several years of technical development for more positive and cost effective protection.**
    - **No insulated joints or impedance bonds.**
- **Remove existing systems.**
  - **Track circuits**
  - **Wayside signals**
  - **Line and power cables**

Babylon to Montauk
Suitability

Existing:

After CBTC:



Babylon to Montauk CBTC Project Plan

- **Establish multi-disciplinary internal CBTC working group and steering committee.**
  - **Fosters cooperation and quick decisions.**
- **Develop general technical requirements.**
- **Establish a project partnering team.**
  - **LIRR**
  - **Vendor**
  - **FRA**
  - **Peer organizations**
  - **Labor organizations**

Babylon to Montauk CBTC
Project Plan

- **Issue RFI.**
- **Prepare specifications based on general technical requirements and RFI responses.**
- **Issue RFP for design/furnish contract.**
- **Evaluate proposals and award.**

Babylon to Montauk CBTC Project Plan

- **Five-phase field implementation**
  - **Phase "0" (pre-CBTC)**
    - **Infrastructure renewal**
    - **Temporary conventional interlocking control**
    - **Temporary absolute block operation via existing track circuits**
  - **Phases 1 & 2**
    - **Train separation**
    - **Speed enforcement**
    - **Employee training**

Babylon to Montauk CBTC Project Plan

- **Five-phase field implementation**
  - **Phases 3 & 4**
    - **Interlocking control by CBTC**
    - **Crossing control**
    - **Employee training**
- **Interoperability specification**
  - **Allow for future competition.**

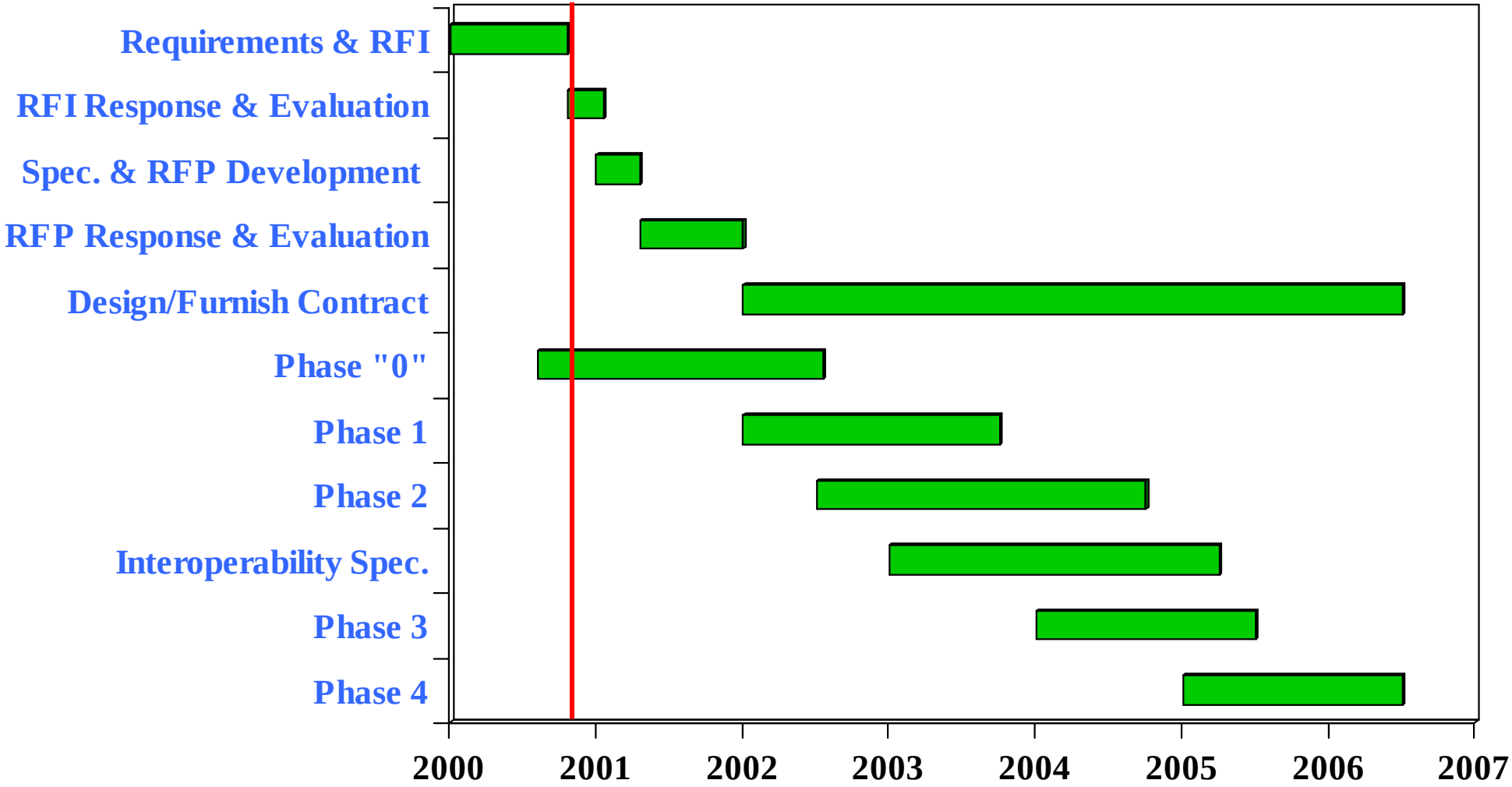
Babylon to Montauk CBTC
Project Plan

- **Territory phasing**
  - **Phases “0”, 1 & 3: Patchogue (PD) to Speonk (SK) only**
  - **Phases 2 & 4: Babylon (BY) to Montauk (MY)**

Babylon to Montauk CBTC
Budget Management

- **Total available funding is $27.4 Million.**
  - **Connected to project phases.**
    - **Each will be bid individually.**
- **Other available funds**

Babylon to Montauk CBTC
Schedule & Progress



Next Steps

- Continue outreach.
  - FRA
    - Outline for 236-H RSPP & PSP
  - Peer reviews
- Continue Phase “0”.
  - Design
  - Construction
- Evaluate RFI responses.
- Develop specification.
- Issue RFP.

Next Steps

- **Finalize scope and phasing.**

Questions